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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/783,419	02/19/2004	Yoshiki Hishiro	MI22-2507	6384

21567 7590 07/14/2004

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SPOKANE, WA 99201

EXAMINER

PERALTA, GINETTE

ART UNIT	PAPER NUMBER
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2814

DATE MAILED: 07/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

KB

Office Action Summary	Application No.	Applicant(s)	
	10/783,419	HISHIRO, YOSHIKI	
	Examiner	Art Unit	
	Ginette Peralta	2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 39-58 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 39-58 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>2/19/04</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 39-58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamahara et al. (U. S. Pat. 6,403,280 B1) in view of Cheng et al. (US Pat. Pub. 2003/0008246 A1).

Yamahara et al. discloses in col. 3, ll. 60-67, col. 4, ll. 1-12, and col. 30, l. 44-col. 31, l. 60, a method of forming a semiconductor construction that comprises providing a semiconductor substrate, forming a first layer comprising silicon and nitrogen over the substrate (col. 31, l. 35), and forming a bilayer of a photoresist system over the first layer.

Yamahara et al. discloses the claimed invention with the exception of forming a second layer comprising carbon -hydrogen bonds over and physically against the first layer.

Cheng et al. discloses a method of forming a semiconductor construction that comprises providing a semiconductor substrate, the substrate may comprise a silicon oxynitride substrate; forming an organic anti-reflective coating layer; wherein Cheng et

al. further teaches that the substrate may be a bilayer substrate comprising a substrate material and an underlayer that may comprise one of polyester, polyacrylates, and fluorinated polymers, among others, and forming a layer consisting essentially of a photoresist system over and physically against the organic underlayer, wherein the organic underlayer is taught for the disclosed intended purpose of using a material that is highly absorbing at the imaging wavelength and compatible with the imaging layer, while protecting the underlying substrate from the acid generated during the development of the photoresist.

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use an underlayer that is highly absorbing at the imaging wavelength and compatible with the imaging layer over the semiconductor substrate for the disclosed intended purpose of enhancing the development of the photoresist layer while protecting the underlying substrate from the acid generated during the development of the photoresist.

Yamahara et al. further teaches exposing the photoresist system to patterned light and subsequently heating the photoresist system (col. 31, ll. 40-46), the photoresist system releasing acid into the system. Cheng et al. discloses that the second layer comprises a polyacrylate or a polyhydroxystyrene, which are compounds that depending on the composition may release acid during the heating. Wherein the release of the acid by the underlayer is a desirable feature as Cheng et al. and Yamahara et al. disclose that the photogenerated acid catalyzes the deblocking process, in which the

blocked insoluble polymer of the resist is converted to a soluble polymer with a hydroxyl group and a volatile component, and the volatile group then generates a transient free volume that augments diffusion and if this process were to stop it would result in an unwanted alteration of the shape of the developed photoresist.

Yamahara et al. discloses that the first layer comprises a silicon oxynitride layer having silicon, oxygen, and nitrogen.

Yamahara et al. as modified by Cheng et al., discloses that forming the second layer comprises spin-coating the second layer across the underlying substrate.

Yamahara et al. discloses that the photoresist bilayer has an underlayer that comprises a surfactant for improving applicability and developability, thus it would have been obvious to one of ordinary skill in the art at the time the invention was made for the second organic layer to comprise a surfactant in order to improve the applicability like Yamahara et al. discloses.

Yamahara et al. as modified by Cheng et al. discloses that the second layer comprises a cross-linked polymer or an acrylic polymer (Cheng et al. [0076]).

Yamahara et al. as modified by Cheng et al. does not disclose the wavelength that is absorbed by the second layer, but various materials are taught that can be used as the second layer, which can be chosen depending on the desired characteristic of wavelength absorbed by the material among other properties. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to select a material that absorbs a wavelength equal to the one applied to the photoresist,

since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416. Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to vary the wavelength that is absorbed by the second layer as there is no statement denoting the criticality of the material or the wavelength that has to be absorbed by the material.

"In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); In re Woodruff, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990) (The prior art taught carbon monoxide concentrations of "about 1-5%" while the claim was limited to "more than 5%." The court held that "about 1-5%" allowed for concentrations slightly above 5% thus the ranges overlapped.)" (MPEP 2144.04)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ginette Peralta whose telephone number is (571) 272-1713. The examiner can normally be reached on Monday to Friday 8:00 AM- 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

GP

Wael Fahmy
SPE 2814